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COVERING TELECOMMUNICATIONS SINCE 1901

IRELAND STEPS UP TELECOM ACTIVITY

FCC poised to cut AT&T, BOC regulation

INTELSAT board OKs PanAmSat

France may pull out of European cellular plan

AT&T, Intel agree on ISDN compatibility

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Ireland Boosts Its Operational Efficiency

The Martello Towers were built to help Ireland solve a pressing communications problem during the Napoleonic Wars nearly two centuries ago. The tower shown on our cover, Tower No. 1 near Dublin, was built between 1804 and 1806. It is owned by Paul Doonan of Carra Comm/Tec, a family-owned business which sells Reliance Comm/Tec products in Ireland. The Irish have steadily improved the national means of communications since then. In the last three years, Telecom Eireann has taken some important steps to further improve communications within the Republic of Ireland.

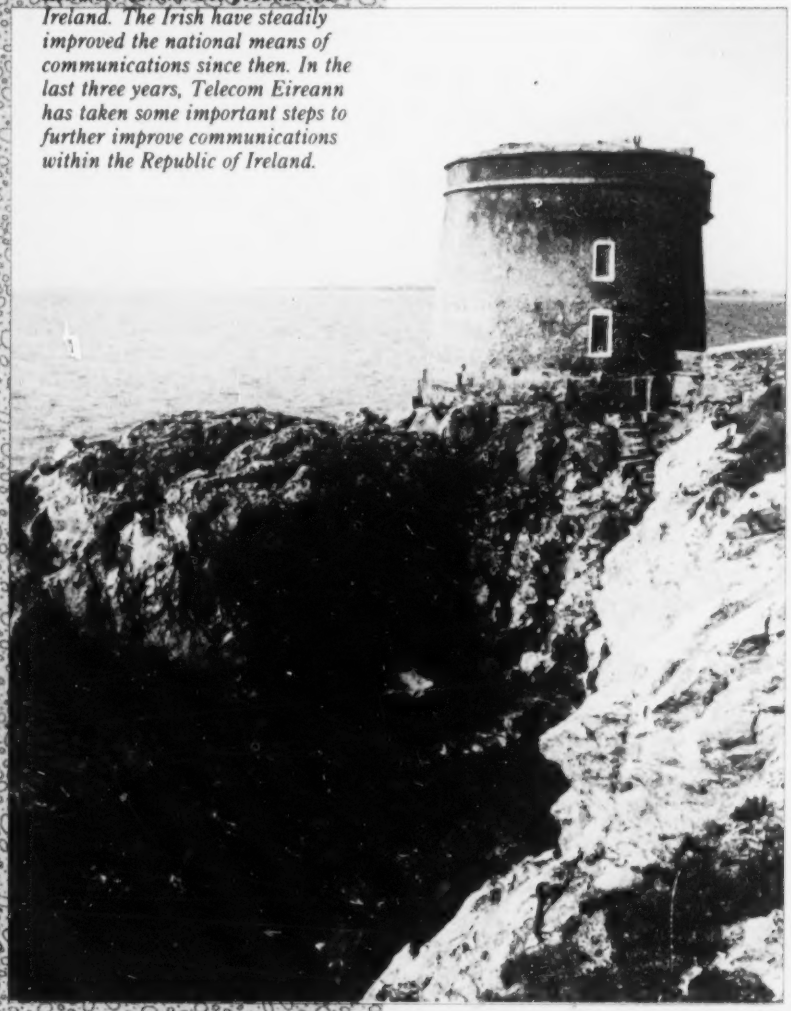

Photo by Gary Moss

LIAM DILLON

THE IRISH have been concerned about the quality of our communications for centuries.

For instance, early in the 19th century, during the long Napoleonic Wars, a series of 30 towers was built along the coast. Known as Martello Towers, they were within sight of each other so if an invasion force approached, the defenders could quickly and efficiently communicate via bonfires and signal flags. The towers also doubled as well-armed fortifications, should an appeal to arms be made.

The Martello Towers were built to last and they have. Unfortunately, they also were expensive to build and maintain. Today, Ireland continues to build its communications system to last and searches for economic solutions for its communications problems. And we are succeeding at both tasks.

Three years ago, the nation decided to reorganize its communications efforts. The Department of Posts & Telegraphs was dissolved. Telecom Eireann is now responsible for the national public switched network.

Telecom Eireann's agenda was dominated by three items. One was the need to convert its central offices to digital switching technology. The second was to improve the reliability of the PSTN. And the third was to reduce the number of held orders—unfilled customer requests for service—throughout Ireland.

We have made significant progress in central office conversions. In 1985-86 alone, 91 digital exchanges went into service, bringing the total to 294, serving some 30% of customers in Ireland. Furthermore, 78 manual exchanges serving some 9000 customers were upgraded to automatic service. Now, fewer than 2% of all customers are still switched manually. By the end of 1987, the network should be fully automatic.

That is an impressive achievement when it is recalled that just eight years ago, nearly 50% of all exchanges serving some 10% of all customers were manual. In other words, we had a large number of small switches serving relatively few subscribers, with a poor ratio of subscribers per switch.

We also have set and are maintaining aggressive objectives for im-

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provements in overall service quality. For example, the failure rate target of 2% or less on local calls was attained in 1985-86. And we are making progress toward a 4% failure rate for national subscriber trunk dialing service.

To enhance troubleshooting and maintenance capabilities in the important Cork area in the southeast, we established our first computerized fault recording and test/repair center. Additional centers will soon be completed in and around Dublin, our capital and most important economic center.

Of everything we have been able to accomplish, however, perhaps of greatest note is that we are increasing our customer base by slashing the number of held orders. As a result, we have achieved a record household-penetration rate of more than 50%, with telephone exchange lines in the network numbering 713,000.

Consider that in 1980, held orders stood at about 92,000, with a total customer base of 472,000. Thanks to projects initiated at that time and efforts that are part of a Telecom Eireann Accelerated Development Program, held orders at this moment amount to less than 2.9% of our current customer total of 694,000. Held orders have been reduced to just 20,000 in only six years. By next year, the backlog should be limited to normal pipeline requirements.

Installation intervals have seen similar improvements. Today, about 50% of the time, customers receive initial service between six and eight weeks after application.

Cable installation projects during the past several years have dramatically improved the backbone of the local network and have contributed significantly to reducing held order headaches. In the year ending April 1986, for example, £12 million ($16.368 million) was invested in local cable and 70,000 utility poles were used, a rate slightly below the previous year. Prior to this intense period of construction, a less conventional technology—at least in the experience of the old Department of Posts and Telegraphs—was introduced as a stopgap measure. Beginning in 1980 and peaking in 1983, thousands of channels of analog subscriber carrier were installed in a wholesale effort to quickly clear large numbers of held orders, some of which were backlogged by seven years.

From a practical point of view, subscriber carrier was a natural solution for installing new customers in areas where cable facilities had been exhausted.

Through studies we conducted when considering purchasing such equipment, however, we found the use of carrier to be competitive with cable in numerous circumstances.

- *When there is no existing plant available.* A 48-channel system working on a 10/0.63 aerial cable on a new pole route becomes the least costly solution beyond 6 km from the exchange.
- *When there is existing empty duct.* With 15/0.5 cable, a 48-channel system is less expensive beyond a distance of 11 km from the exchange.
- *Where there is existing pole route carrying only open wires or trunk cable.* Where this circumstance prevails, two points must be considered.

First, if the route can accommodate a 75/0.63 cable without rebuilding, it would be the least costly method for providing service up to 6.6 km. Thereafter, a 48-channel subscriber carrier system working on a new 10/0.63 cable would be a more cost-effective approach.

Second, if the route cannot support a 75/0.63 cable but will accept a 10/0.63 cable, a 75/0.63 cable on a rebuilt route would be prudent up to 4 km. Subsequently, a 48-channel carrier system on a new 10/0.63 cable would be the least costly solution.

After conducting our application studies, we studied the equipment market and selected subscriber carrier products from R-TEC Systems, a Reliance Comm/Tec unit located in Bedford, Texas. We have relied on these products throughout the

Continued on page 32

Technicians Eddy Buggle (l) and Peter Egan (c) of Telecom Eireann discuss digital technology with Pat Doonan, president of Carra Comm/Tec, at one of Telecom Eireann's COs.

FIGURE 1 USE OF SUBSCRIBER CARRIER IN IRELAND 1980-1986

YEAR	HELD ORDERS	TELEPHONE LINES INSTALLED	CHANNELS OF CARRIER INSTALLED		% OF CONNECTIONS VIA CARRIER
			SINGLE CHANNEL	MULTICHANNEL	
1980 (end of)	92,000	62,000	1300	240	2.5
1981	86,450	68,000	0	3040	4.4
1982	78,000	58,500	6000	5920	11.4
1983	60,250	54,600	0	8640	12.0
1984	50,513	76,000	4460	4032	8.4
1985	27,736	75,000	4000	0	5.3
1986 (estimated)	20,000	78,000	0	4600	5.0
TOTAL		472,100	15,760	26,472	8.9

1980s, with the results indicated in Table 1.

One of our first purchases was the manufacturer's AML-II single channel carrier system, which electronically doubles the capacity of an existing cable pair or provides a pair gain factor of one. Terminals are installed both at the subscriber premise and in the central office. CO modules are just 5.23 in. high and are mounted in 19-in. or 23-in. racks.

Single channel carrier allowed us to quickly and inexpensively offer service in awkward situations, such as when a single customer was waiting for service in an area where no new cable installation was imminent. Not only could customers be hooked to the network quickly, but a return was immediately earned from the equipment. If cable had been specified in the same situation, much of the investment would have lain fallow until more customers were installed.

For higher-density applications, three versions of the CM-8 multichannel carrier have been used. This configuration is functionally identical to AML-II, but the pair-gain factor is seven. This means that on a single pair of cable, eight customers can be served.

Originally, the 48-channel version of the multichannel was employed, but an enhanced 24-channel model has now been standardized by Telecom Eireann. Called CM-8 Hi-Density, this version offers greater reliability because of an improved powering configuration. It also is an extremely compact package, with 24 channels occupying only 7 in. of height in a 19-in. central office rack. Each rack contains three systems, each comprising four modem cards and one common equipment card.

The system is designed to operate over a frequency line loss of 40 dB without the use of repeaters. Under normal limits, the system operates out to 140 dB using a maximum of three repeaters.

Since 1980, more than 42,000 channels of single and multichannel carrier have been installed in Ireland's eight districts. The first equipment was used in the Cork District, which had the worst held order delay. During 1983 and 1984, the use of carrier was so widespread in Cork that up to 20% of all new customer connections made during that time involved this electronic technology. During the same period, up to 12% of new installations nationwide used subscriber carrier.

Once subscriber carrier proved itself to be an effective tool, a number of creative applications were developed. For example, rural areas commonly contain scattered sites with 30 to 100 lines where it is not economical to install a central office. In such cases, carrier now is often specified to consolidate service and then, in combination with copper cable, fed into centrally located automatic exchanges.

Subscriber carrier also proved to be very much at home under urban conditions. As a temporary solution, the multichannel carrier system has been used in the center of Dublin to connect apartment buildings and office blocks, even in short-run circumstances where cable may have been cheaper.

With the success of new cable projects under way as part of Telecom Eireann's Accelerated Development Program, the need for new subscriber carrier is on the wane. Part of the beauty of carrier products, however, is that they can be removed and recycled at other locations when their original function is supplanted by the installation of permanent cable. The equipment can be reinstalled and continue to generate revenue in a second life.

While the held order problem in Ireland has been dramatically reduced, it has not been eliminated. There are still roughly 20,000 potential customers, or about 5% of the total subscriber base, waiting for service. So, it is likely that subscriber carrier will remain part of the solution for some time to come.

And Telecom Eireann will continue its massive commitment to capital improvements. In the 1985-86 period, this amounted to £29 million, and nearly that again by the end of the 1986-87 year. The liability associated with this aggressive effort, however, is our £1.1 billion debt.

Nearly all other current statistical indices are very encouraging. Net demand for customer lines in 1985-86 was 62,000, spurred perhaps because of a 33% reduction in connection charges. Traffic was up 10%. International calling increased by a hefty 12%.

The bottom line is that operating revenues for 1985-86 were £75 million, up 44% from the previous period. Although a £24 million deficit was recorded for the year with the inclusion of financing charges, Telecom Eireann has established a positive and durable tone for the future of telecommunications in the Irish Republic, both technologically and financially.

Like the Martello Towers, our system will function efficiently and it will last, in large part thanks to our efforts to control costs by using innovative technology. □